

Digital transformation for retailers: Drivers for success

by David Smith

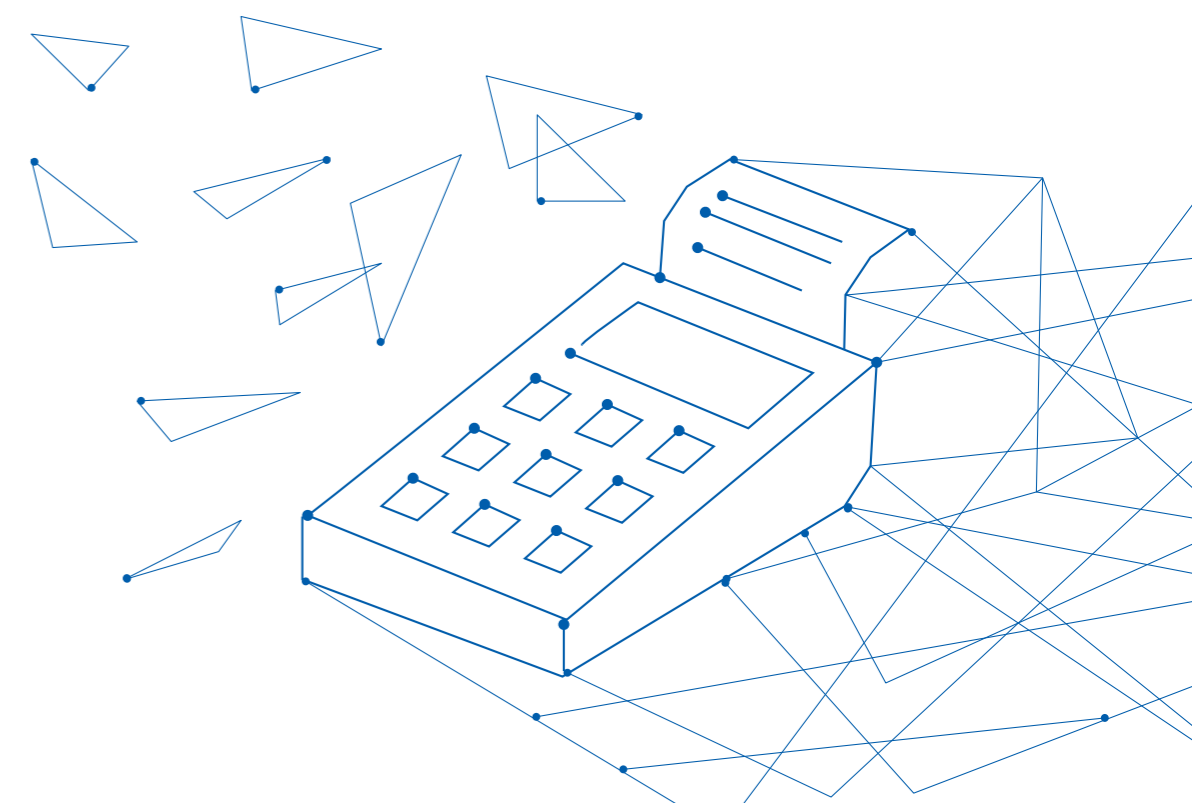


Contents

Introduction	3
State of digital transformation across retail	4
The IoT - present state and future forecasts	5
Data and the customer interface	6
Sorting the wheat from the chaff	6
(Real-time) data driven organisations	6
Enabling new business models	7
The Cloud - present state and future forecasts	8
XaaS	9
Security and management	9
Building tomorrow's organisation	10
Engaging customers and staff: the new CX	11
Know your customer in-store	11
Consumer engagement	12
The instore experience	12
The expanding omnichannel	13
Organisational change accompanies tech change	14
The networked organisation	15
A call to action	16
References	17
About the author	18
About Hughes Network Systems	19

Introduction

The range of technology and the spread of its impact is changing the way we think, innovate and reimagine nearly every industry. Until relatively recently, technology was often geographically isolated and confined to a given system, process or business silo. Tech often sat at the edge of the business as an addendum to strategy. Many of these legacy IT systems are now too slow and rigid for the demands of digital business. The value of technology now lies in its ability to connect people, objects and data, and by so doing create new ways of working, new service propositions and business models. Connectivity and the network now sit at the centre of digital transformation rather than the edges; the ability of consumers and employees alike to engage, connect and collaborate all depend on it – and therefore determine the ability of retailers to thrive and even just survive.



State of digital transformation across retail

Accenture suggests that while ‘...technology for the last 25 years has been something we can use, we’re entering a new era where technology is who we are’. This is as true for companies as it is consumers. Whilst 87 percent of executives across all industries accept that technologies will disrupt their industries, only 44 percent say their companies are doing enough². Among retailers, a paltry 15 percent suggest their company is setting the pace for digital transformation³.

Part of this failure is conceptual, since 21 percent of firms still see digital transformation as a ‘one-off project’ rather than a continuous effort⁴. Another failure is to base efforts around their existing technological stock rather than around the customer and disappointingly less than 40 percent have aligned internal teams to put customers at the forefront of their digital activities⁵. As influence and power shifts from retailers to consumers, ‘...retailers face tremendous pressure to deliver new business capabilities faster⁶, to remain competitive, to remain relevant.

Due to these failures, half of all digital transformation projects have stalled⁷ and of an estimated \$1.2 trillion spent by companies globally on digital transformation in 2018, only 1 percent of these efforts are forecast to achieve or exceed their expectations⁸. The cost of missing out on this transformation toward an era of a programmable economy – and the confluence of technologies such as the Internet of things (IoT) and the cloud this implies, could be enormous. Efficiencies and new business value worth more than \$3 trillion by 2030⁹ is expected to be created by digital transformation.

Percentage of executives across all industries that accept that technologies will disrupt their industries.

Percentage of retailers that say they’re setting the pace for digital transformation.

The IoT – present state and future forecasts

It is perhaps unsurprising that the retail and consumer goods sector, more than any other, sees the IoT as being central to its digital transformation strategies. 56 percent of the sector see it this way, compared to 54 percent in IT and tech and 52 percent in financial services¹⁰. The value of the global connected retail market was \$16.3 billion in 2016 and \$19.4 billion at the end of 2017, and further growth is expected, with the market expected to touch \$82.3 billion by 2025¹¹. Given that, by 2030 more than two-thirds of purchases are forecast to still occur in physical stores¹² (and an even greater percentage influenced by in-store experiences), the IoT is emerging as a pivotal retail architecture.

Hughes’ own research reveals that 74 percent of retailers are looking to expand their physical footprint, with 50 percent also looking to concurrently boost in-store tech investment and 62 percent planning to increase their online tech spend. The IoT is able to span both online and physical tech spend. In-store, retailers could determine customers’ profiles and their buying history¹³, whereas streamlined supply chains and inventory management can also boost the online experience¹⁴. All told, consumer spending on the blurring confluence of physical and online commerce – digital commerce, could reach \$14.7 trillion by 2022, up by 60 percent on 2017’s figure of \$9.2 trillion¹⁵.

The value of the global connected retail market expected to be in 2019.

The value of the global connected retail market expected to be by 2025.

The IoT – present state and future forecasts

Data and the customer interface

In the mid 2010s, it was common to proclaim that every company is a technology company. Whilst still true to a greater or lesser extent, depending on industry, technological and business model innovation has progressed further still. The mantra that every business is a digital business is rapidly morphing into ‘...every industry is an internet of things industry’¹⁶.

The statistics are compelling. 4,756 IoT connections are made every minute¹⁷. The number of connected things in use will go up to 25 billion by 2021, from 14.2 billion in 2019¹⁸. By 2025, we are forecast to interact with connected devices 4,800 times per day¹⁹. The continued growth of mobility and IoT means ‘...retailers are capturing real-time information about their stores that is often richer than the data they can get online’²⁰.

With IoT data growing twice as fast as social and computer-generated data²¹, the consumer IoT market is projected to reach \$104 billion by 2023²². Many retailers are still trying to figure out how to make the most out of IoT: nevertheless, retail IoT could be a \$94 billion market by 2025²³. New data architectures will likely be required; customers, first and foremost, want problems solved – something that may go beyond an app and indeed individual business silos. Real-time, multidirectional data will deliver situational information and insight, requiring new data strategies and even organisational set-up.

Sorting the wheat from the chaff

With data volumes doubling every two or three years, the amount of global data stored and analysed is forecast to rise from just 1 percent today to 37 percent by 2025, implying up to \$5 trillion in annual benefits²⁴. However, many companies are not well placed, either technologically or organisationally, to gain advantage from this data.

Approximately half of executives admit to not capturing the full value of their data²⁵, with business silos, lack of cohesive data structures and inadequate analytical talent all hampering efficacy. The result of a lack of unified system and structure is often bad data, which has both a direct and indirect cost. The cost of bad data is estimated at 15 to 25 percent of revenue for most companies, with rising data volume obviously enhancing this impact²⁶. This is a problem where some 79 percent of executives continue to base decisions, processes and strategies on data, with large swathes of data remaining unverified as factually correct²⁷. The more indirect cost could lie in breaking consumer trust – one only needs to think about how bad data could inform inappropriate personalised offers –and ultimately harming brand image.

(Real-time) data driven organisations

As we transition from the digital to the intelligent age, few would argue that we live in an age of data, yet alarmingly, the share of companies that call themselves data-driven is falling, not rising²⁸. There is almost unanimity in executive attempts to develop data driven organisations, with over 98 percent professing to do so, yet less than a third report success in achieving a data-driven business culture²⁹.

The IoT, augmented reality and the omnichannel are making today’s consumer shopping experience more connected, mobile, and data-driven. Thanks to companies like Amazon and Baidu, expectations have been heightened to the point that 76 percent of consumers now expect organisations to understand (and act upon) their individual needs³⁰. Indeed, 80 percent of consumers indicate a greater propensity to purchase from a company that offers personalisation³¹. The technological opportunity for this will grow enormously; the global data-sphere is forecast to grow from 33 zettabytes in 2018 to 175ZB by 2025³², with close to 30 percent of data generated in real-time by that date³³.

However, the implications of data-driven organisations do not end at the consumer interface. Back end processes, business strategy and even organisational structures all need to adapt to new technologies such as the IoT. As a result, over half of executives (52 percent) expect their organisation to ‘...substantially change approach in collecting, interrogating and integrating customer feedback over next three years’³⁴.



The number of connected things in use in 2019.



The number of connected things predicted to be in use in 2021.

The IoT – present state and future forecasts

Enabling new business models

For those with the foresight and capacity to change, the IoT will prove a key catalyst of further enabling, or rather compelling, retailers to reinvent products and services, internal operations and business models³⁵. This is because it should be thought of as more of an architecture or foundation to build engagement and propositions on, rather than a single technology.

Consumer change is opening ever more possibilities. 43 percent of consumers are receptive to the idea of retailers personalising prices³⁶, while 63 percent globally say they would permit home sensors to automatically order household goods as needed³⁷. SAP suggests ‘... such background shopping will be so convenient, sophisticated and attuned to our lives that we’ll barely have to think about it’³⁸. 54 percent of Asian retail execs believe that by 2025, ‘...machines will become customers as people delegate low-involvement decisions to their bots’³⁹.

This may shift the role of the store, but not the need for the store. Even if consumers’ physical location at a given time does become the future competitive battleground, it is still likely, notes Accenture, that ‘...physical stores will evolve into experience centers: engaging, immersive environments where consumers can interact with products and services they might want to buy, and learn about them in a personalized setting’⁴⁰. This will likely require a solid and unified technological underpinning. Such an infrastructure would also allow future ‘...successful businesses (to) design their business processes around harnessing data from every department to fuel AI, just as industry once built around harnessing electrical power from other sources to fuel machinery’⁴¹.

Other avenues are open for the development of IoT centered business models. Perhaps most prominently, ‘Just Walk Out’ shopping and other smart checkout tech pioneered by the likes of AmazonGo could create a \$45 billion market by 2023⁴². Sustainability could also become a key and actionable driver of success; while 98 percent of business executives see the IoT contributing to a sustainable future, yet today only half currently use data and connectivity to support such efforts⁴³.



The Cloud – present state and future forecasts

If every business is indeed morphing from a technology business through a digital phase and into an IoT business, then it is also likely to make use of the cloud. One study claims that all industries, at varying speeds, are moving towards a hybrid cloud environment. Retail is cited as one of the more advanced industries in this regard, with 64 percent of retail and eCommerce respondents saying they have hybrid environments⁴⁴.

However, the actual industry workload in the cloud is somewhat lower as of December 2018 – at just below one quarter, although ‘...retailers expect that to rise to one-third in 2020⁴⁵’. The reasons for this rise are myriad. IT operating costs typically yield a 15 percent to 40 percent saving⁴⁶, depending on existing IT set up, industry and use. Improved performance and agility are also common benefits from switching to the cloud. This accounts in part for Oracle’s forecast that ‘...80 percent of all enterprise (and mission-critical) workloads across all industries will move to the cloud by 2025⁴⁷’.

For retail, the specifics of how performance and consumer experience could be enhanced fall into two ledgers; on one hand the back end workflows and on the other, the front end⁴⁸.

The front end workflows require real-time data and decision making to inform:

- Pricing and margin management,
- Website and recommendation-engine personalisation, and
- Loyalty-program management.

The back end workflows that have both direct consumer and procedural impact include:

- Real-time inventory visibility,
- Omnichannel order fulfillment, and
- Inventory optimisation⁴⁹.



Enterprise (and mission-critical) workloads across all industries that will move to the cloud by 2025.

The Cloud – present state and future forecasts

XaaS

Products – not least software, platforms and other technologies – are increasingly being converted to services, and in doing so, becoming more automated, online and experiential. Everything is now as a service (XaaS). Just as with consumer trends, the end user pays for the experience of using a service, or the access to it, rather than owning the product.

The extent to which business supports such changes is marked. A 2018 report cited nearly 51 percent of all companies as reporting a majority of their applications as SaaS-based. That number is expected to rise to 73 percent by the end of 2019, and to 86 percent by 2021⁵⁰.

By incorporating the cloud’s rapid deployment model, XaaS could also prove an effective driver of new revenue for innovative retailers⁵¹. A Deloitte survey reveals that 76 percent of all businesses see XaaS as assisting in their rapid design and deployment of new services⁵²: A useful secondary impact, from the CIO’s perspective, is that these changes can help shift the notion of IT as a cost-centre towards IT as a driver of digital business strategy and potential source of new revenue streams.

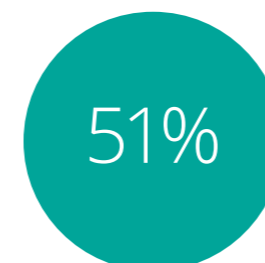
However, since few CIO’s, and especially those in retail, have the internal talent to build scalable analytics platforms or turn complex data into insight, it is likely that scalability, reliability and security issues will likely need to be taken care of by trusted third parties and partners.

Security and management

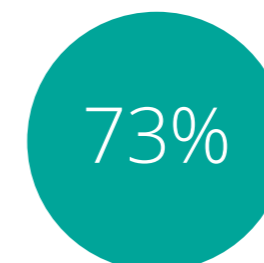
Half of U.S. retailers were breached in the past year, as were 27 percent globally⁵³. Globally, attacks and breaches at the cloud provider remain the top cloud security concern for retailers at 61 percent. Security and privacy controls will need to be built at the edge and intrinsically part of every device and network. To mitigate any risk associated with data storage or security, users will increasingly ‘...need to guarantee that their cloud security strategy keeps up with the pace of this growth⁵⁴’.

Hybrid cloud deployments could help with this. The retail industry currently has the second largest penetration of hybrid cloud deployments at 21 percent among all industries; with 93 percent of retailers identifying hybrid cloud as the ideal IT model, outpacing the global average for other industries⁵⁵. For retailers, having the flexibility to choose the right cloud for each application appears most often as the chief benefit for deploying hybrid cloud (at 18 percent) followed closely by using cloud ‘on the fly’ to support periods of high traffic loads. Given the seasonality of business and variance of IT and network consumption needs throughout the year, retailers understand the need to keep IT flexible. However, hybrid cloud skills ranked second in scarcity for retailers (30 percent⁵⁶), behind A.I skills, indicating a need for close collaboration with trusted partners and third parties.

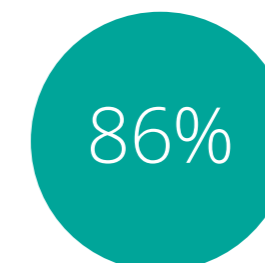
Cloud deployment could also help craft new wider management practices. 87 percent of retail firms view their current working hours and practices as overly rigid, something that a range of technologies can help mitigate. As the industry and the jobs it offers evolve, it will need to offer increased flexibility at a minimum. One possible result of the boom in video chat technology and connectivity more generally, is that personalised advice and customer service could be performed remotely by staff⁵⁷.



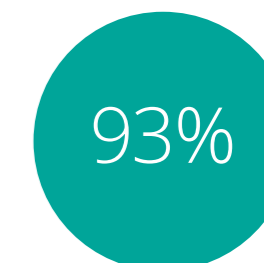
Companies in 2018 that have SaaS-based applications.



Companies in 2019 expected to have SaaS-based applications.



Companies in 2021 predicted to have SaaS-based applications.

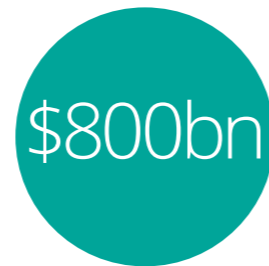


Percentage of retailers identifying hybrid cloud as the ideal IT model.

Building tomorrow's organisation

The World Economic Forum states that fluid consumer demands will '...cause the retail and consumer packaged goods landscape to change more in the next ten years than it has in the past forty⁵⁸'. Yesterday will not suffice for tomorrow. Global consumer patterns are being permanently rewritten along the lines of influence, personalisation and trust. Indeed, personalisation is reckoned by Boston Consulting Group to drive a revenue shift of \$800 billion by 2022 for the companies that get it right⁵⁹.

The most obvious conduit for change remains technology. Engagement technologies such as virtual reality and augmented reality that give rise to immersive retail will help create new and increasingly personalised consumer experiences. The confluence of advanced analytics and context-specific data shift the balance of power away from the blurring manufacturer/retailer and towards the consumer.



The amount personalisation is reckoned to drive revenue by in 2022.

Building tomorrow's organisation

Engaging customers and staff: the new CX

This changing nature of engagement fundamentally shifts the product and services retailers can offer. For example, Buy+, a Chinese virtual reality shopping experience backed by Alibaba, engaged over 8 million users within a week of launching⁶⁰. Imagine if this experience could be tailored to your whereabouts, your purpose in that given location and your transaction history.

The changing nature of engagement changes the product, and since the IoT provides an expansion of quantifiable parts, we will have ever more data at which to shape price and service points. This is just as well since around 80 percent of consumers are demanding new consumption models⁶¹.

However, a great paradox lies at the heart of consumer engagement. 61 percent of American consumers, and 48 percent of British, say they'll share more data with a company in return for customised communications from them⁶². The problem, as other statistics suggest, is that only 17 percent of consumers believe personalised ads are ethical⁶³. This presages the question of whether consumers really know what they want? As Steve Jobs noted '...a lot of times, people don't know what they want until you show it to them'.

Technology and the human element are often seen as opposites, with some justification. Where used solely as a cost cutting element, technology can have ruinous impact on both staff and consumer engagement as anyone who has pressed '2' for other services can attest. In fact, 59 percent of consumers say companies have lost touch with the human element of their customer interface⁶⁴. Technology can help remedy this, implanted strategically, by helping free customer service agents for the more involved tasks. The import of this cannot be over-estimated: IDC predicts that 90 percent of consumer goods industry growth over the next decade will be captured by companies that succeed at direct engagement with consumers⁶⁵.

Culture is identified by 46 percent of CIOs as the largest barrier to getting the benefits of digital business⁶⁶. Engaging workers will be key in digital transformation efforts and change management must form a component of it. This will be complicated by an evolution in the skillsets required to work effectively in retail. There will likely be an increased need for professional customer service aides and skills such as problem solving and innovative design, while perhaps less demand for cashiers and other increasingly automatable tasks⁶⁷.

Know your customer in-store

Hughes research shows that 91 percent of retailers agree that collecting customer data will enable them to better inform future strategy. 96 percent say customer data collection will also allow them to decide which technologies to use, while 89 percent point to it helping devise and improve loyalty schemes. Walgreens in the United States is already '...using cameras, eye-tracking, and motion sensors to show you real-time ads meant to influence which ice cream you buy⁶⁸'. We are at the start of a quantified consumer era, and those that use this permissively could build strong competitive advantages.

This era will blur the difference between existing market boundaries further, yet offer an infinitely richer picture of real-time consumer indicators by including contextual and situational information. One of the next big trends in analytics, notes Wharton⁶⁹, is the emergence of geospatial targeting. Establishing someone's physical location and targeting offers accordingly could open-up whole new business models, redefine consumer relationships and supply trustworthy firms with swathes of insight rich data.

Harvard Business Review correctly notes that '...the next generation of smart assistants and connected devices will learn from user habits and pick up on behavioural and environmental patterns in order to make these experiences more predictive⁷⁰'. Demonstrating and delivering value to the customer will be key in gaining trust and acceptance as models become ever more consumer-centric. Of equal importance is that there are more points at which we can engage consumers, especially with forthcoming micro-GPS that can better contextualise data to within mere feet of our position, and the ambient passivity with which we will 'interact' with technology. Emerging data sources and personalisation will ultimately spawn new services and even industries, enabling retailers to add value in entirely new ways.

59%

Percentage of consumers that say companies have lost touch with the human element.



Building tomorrow's organisation

Consumer engagement

77 percent of consumers say they're quicker to retract their loyalty today than they were three years ago⁷¹. Engaging the consumer becomes an ever more important activity, not just in gaining their attention but helping solve their problems. Engagement before, during and after a purchase remains a key goal for CMOs but is likely impossible with both organisational data silos and unconnected IT systems.

However, customers are starting to generate or present different identities across different platforms. The danger for brands is of incomplete consumer pictures and profiles and therefore knowing when and how to engage then becomes problematic. 'They no longer just need to work out who the consumer is, but which of that consumer's identities they are dealing with⁷²'. Current segmentation models will need to become ever more complex and granular without appearing to be overly invasive. IoT and cloud technologies can both form the basis of a new unified view of the customer and act as a structure to launch other technologies such as machine learning. For example, machine learning can perform real-time data analysis at a preferable rate to humans, especially if given an integrated and unified set of multiple data sources, as can be provided by the cloud⁷³. Ultimately such advances must be used to benefit consumers.

Customer expectations are also rising with regards to engagement. Hughes' research shows that investing in the following technologies in the next five years are high on retailers' radar:

- Augmented reality considered important by 81 percent of retailers,
- Artificial intelligence by 86 percent,
- Virtual assistants by 87 percent,
- Free Wi-Fi by 88 percent,
- Customer journey data analytics by 95 percent, and,
- Alternative payments by 96 percent.

There is a need for retailers to move from plans to implementing these technologies selectively. Retailers are cited as '...not engaging enough with digital wallets despite 54 percent of adults saying they want more integration⁷⁴'. With executives across all industries expecting cash transactions to shrink by 80 percent by 2025⁷⁵, and cash set to fall to just 21 percent of UK sales a year later⁷⁶, retailers need to develop a comprehensive outlook on what engagement is, what it involves and means for their tech infrastructure and how to deliver it on consumer-centric terms.

The instore experience

If physical stores are to transform into experience centres as part of their future role in digital commerce, significant change is required. 83 percent of shoppers currently believe they're more knowledgeable than retail store associates⁷⁷; such perceptions are simply unsustainable in an intelligent future. The answer will in part, lie in empowering frontline workers with precise and accurate technological tools. Indeed, a fully human system is unlikely to satisfy consumer demands; 42 percent of mobile consumers report having abandoned a purchase because shipping would take too long⁷⁸. Research by GfK found 38 percent of U.S. consumers hope to see improved experiences in stores, while 35 percent want improved customer service based on individual needs⁷⁹.

Nearly 6 in 10 executives believe their workforce isn't '... sufficiently security savvy', enough to move forwards with digital transformation⁸⁰. Introducing appropriate technology interfaces at the employee level, and training around this, can help. Walmart is distributing 17,000 virtual reality headsets as part of its training strategy as the Oculus Go gear is proving to boost store associate retention and confidence. It also reported 10-15 percent improvements in internal associate testing following VR use⁸¹. Such technologies, if supported by a stable network, could also enhance the consumer experience since 64 percent of consumers indicate liking the option of using virtual reality to navigate a personalised in-store experience⁸². Such initiatives are likely to grow quickly and help establish tomorrow's winners as Goldman Sachs forecasts the market for AR and VR in retail to reach \$1.6 billion by 2025⁸³.

Firms need to adopt a customer-based approach that considers value within the broader context of a customer's lifeworld. To succeed at scale will require close attention to design principles and crafting truly consumer-centric business models that incorporate technology 'invisibly' and unobtrusively as well as significant investment in change management and human skills and preparedness.



The amount AR and VR in retail will reach by 2025.

Building tomorrow's organisation

The expanding omnichannel

Nearly 80 percent of retailers say it's 'business critical' that they integrate omnichannel experiences into their stores⁸⁴, but in Europe at least, only 25 percent feel that they are on the right track⁸⁵. Due to the expanding omnichannel and networked nature of technologies '... we're no longer in a place where we can pick even the Top three or Top five technologies...you've got to look at everything simultaneously. It's a different way of thinking⁸⁶'.

At a minimum, retailers need to heed consumer expectations forged by competitors and in other spaces. 75 percent of consumers expect a consistent experience wherever they engage and 87 percent think brands need to do more to provide a seamless experience⁸⁷. The technological and organisational agility to adapt to this will be key.

Consider for example that voice shopping is expected to jump to \$40 billion annually in 2022 in the United States, from \$2 billion today⁸⁸. Around 40 percent of U.S., Millennials already use voice activated intelligent assistants before making a purchase. In Asia, this figure rises to 51 percent in Thailand and China, and 57 percent in Japan⁸⁹. Organisations '...will also need to ensure robust integration of the voice channel with internal business operations, e.g. supply chain, order management, customer relationship management and marketing strategy⁹⁰'.

Social shopping is likewise still in its infancy, but research suggests it could generate revenues of \$165 billion globally by 2021⁹¹. 47 percent of Millennials consumers use social media during their shopping journey compared to 19 percent non-millennials⁹².

Preparing the groundwork for such eventualities should start now. Technologically, Hughes notes that 74 percent of retailers plan to invest in alternative payment technology with a year. 57 percent plan to invest in customer journey data analysis, 45 percent plan to invest in artificial intelligence, 43 percent in virtual assistants and 42 percent in augmented reality before 2020. These investments increasingly need to move beyond proof of concept to on the ground consumer-centric propositions as the omnichannel becomes a type of singularity.

Those that cannot account for prosaic engagement channels have little time to prepare for what comes next. 47 percent of current consumers that use their smartphones for ecommerce are receptive to a service that automatically restocks everyday items⁹³. Globally, nearly one in three consumers say they plan on buying an AI powered device or virtual personal assistant, but this is close to 50 percent in some East Asian countries⁹⁴.



Organisational change accompanies tech change

The gap between ‘what’s possible’ and business as usual is in many cases widening. Technology is evolving at a rate far greater than many retailers and wider businesses can adapt to, let alone use effectively in a strategically coherent manner. Boundaries between on and offline will continue to blur, as will retailer and manufacturer. New value pools and markets could open to those with the vision and strategy to make this happen.

In an analysis of successful companies, MIT Sloan concludes that ‘...history warns us that mastering digital technology won’t determine which companies become corporate winners. Instead, making the necessary organisational and leadership changes will⁹⁵. There is little evidence, across all industries, that structures supporting future leadership are in place; whilst the future is digital, only 5 percent of organisations possess a strong digital leadership development program. 65 percent of all organisations have no such program⁹⁶, and 30 percent of organisations admit to having a weak or very weak leadership pipeline⁹⁷. Hughes’ research suggests retailers are broadly aware of some of the barriers to success – 59 percent of retailers note that stakeholder buy-in is impacting their implementation of new tech, 52 percent cite a lack of in-house expertise and 57 percent issues surrounding managing employee training.

We are at the start of the consumer evolution, not the end, and those wishing to continue its journey must start by looking at their own practices, limitations and strategies first. Businesses will likely require a revision of silo boundaries, with organisation and business models that truly place the consumer front and centre dominating. In the intelligent economy, customer-centricism is incompatible, in most instances, with product dominated supply.



The networked organisation

People, sensors, and devices are increasingly interconnected, in many cases beyond traditional organisational boundaries. Nevertheless, an underlying unified physical network is needed to base these technologies on and around. The creation of such a physical network is often complicated by the widespread belief in IT as a siloed cost centre that often results in piecemeal tech investment and innovation. What tech networks can provide, first and foremost, is a new way of doing business that differs from all previous iteration of IT advancements⁹⁸. What retailers could then build on top of this goes a step beyond even that.

Tomorrow’s organisations will increasingly inhabit a network of networks, whether they orchestrate, facilitate or contribute to such networks. It is likely that ‘...the network will help companies understand the dynamics of their business and whether their operational metrics are where they should be⁹⁹. The future IoT and cloud network, comprising company, supply chain, subcontractors, markets, investors and more will all exist within a single network, yet constituent parts will inevitably be enmeshed in other networks. Add to this the likelihood of an expanded omnichannel allowing consumers to form their own networks – through voice assistants, social shopping and IoT based objects – and their increasing integration with retailers’ physical networks.

Network-centric businesses would appear to be the way forward for many industries – as is demonstrated in the construction industry; each project sees a reconfiguring of constituent parts based on what is needed. Common forms of dataflow will be necessary if partners are able to work collaboratively on a given issue or project.

A call to action

With the industry set to change profoundly over the next decade, technology and how to use it presents both a challenge and an opportunity. The need to develop capabilities fast means that every company, in terms of front end, back end – or perhaps both, are becoming IoT companies.

This is not a means in itself however. Fundamentally the IoT is an architecture or foundation to build engagement and propositions onto. Engagement with staff and customers, likely impossible with traditional organisational data silos and unconnected IT systems, is becoming a key future success factor. The rate of tech change has far outstripped our ability to respond organisationally or at times conceptually, necessitating both closer collaboration and partnerships with trusted third parties to plug the talent gaps and absent processes.

The emerging network encompassing both corporate and consumer input is moving from mere utility to a critical enabler of a range of future growth strategies. Retailers have never been faced with so many opportunities, or challenges if these trends are ignored, to build tomorrow's consumer centric enterprises. Neither have they had as much ability to rapidly remedy misaligned IT, scarce analytical talent and the very nature of the product or service they are selling. The time to consolidate digital transformation is now.



References

- 1 Source: Accenture, via Wired, 2018 <https://video.wired.com/watch/wired25-accenture-cto-paul-daugherty-on-reimagining-the-future-of-business>
- 2 Source: MIT Sloan Management Review, 2018 <https://sloanreview.mit.edu/article/why-companies-dont-respond-to-digital-disruption/>
- 3 Source: Forbes, 2018 <https://www.forbes.com/sites/michelleevans/2018/10/22/what-it-will-take-to-be-competitive-in-2040/#1daa8fcb1735>
- 4 Source: Forrester, via CIO Magazine, 2018 <https://www.cio.co.nz/article/640688/some-business-leaders-still-see-digital-transformation-one-off-project-forrester/>
- 5 Source: Cognizant, 2018 <https://www.cognizant.com/perspectives/beyond-silos-fusing-digital-across-the-enterprise>
- 6 Source: McKinsey, 2018 <https://www.mckinsey.com/business-functions/digital-mckinsey/our-insights/the-cloud-as-catalyst-for-retail>
- 7 Source: Forrester, cited by Which50, 2018 <https://which50.com/half-of-digital-transformation-projects-have-stalled-says-forrester/>
- 8 Source: World Economic forum, 2018 <https://www.weforum.org/reports/the-digital-enterprise-moving-from-experimentation-to-transformation>
- 9 Source: Cisco, retrieved 2018 <https://www.cisco.com/c/dam/en/us/solutions/collateral/digital-transformation/blockchain-whitepaper.pdf>
- 10 Source: Economist, 2017 <https://www.eiuperspectives.economist.com/technology-innovation/iot-business-index-2017-transformation-motion/article/transformation-store>
- 11 Source: Retail Dive, 2017 <https://www.retaildive.com/news/iot-to-drive-the-connected-retail-market-to-823b-in-2025/517267/>
- 12 Source: AT Kearney, 2017 <https://www.atkearney.com/retail/article?/a/the-future-of-shopping-centers-article>
- 13 Source: Grand View Research, 2018 <https://www.grandviewresearch.com/industry-analysis/internet-of-things-iot-retail-market>
- 14 Source: Network World, 2018 <https://www.networkworld.com/article/3324484/6-ways-iot-is-transforming-retail.html>
- 15 Source: Biz Community, 2018 <https://www.bizcommunity.com/Article/196/168/177993.html>
- 16 Source: Forbes, 2018 <https://www.forbes.com/sites/forbestechcouncil/2018/07/30/the-industrial-internet-of-things-digitalization-and-the-future-of-business#3fcbf5bd706b>
- 17 Source: Entrepreneur, 2018 <https://www.entrepreneur.com/article/314672>
- 18 Source: The Economic Times, 2018 <https://economictimes.indiatimes.com/tech/internet/25-billion-connected-things-will-be-in-use-by-2021-gartner/articleshow/6655519.cms>
- 19 Source: Seagate, 2018 <https://blog.seagate.com/business/data-becomes-life-critical-a-fundamental-change-transforming-the-way-we-live/>
- 20 Source: Accenture, 2018 <https://www.accenture.com/us-en/blogs/blogs-al-sambar-intelligent-retail-enterprise>
- 21 Source: IBM, retrieved 2018 <https://www-01.ibm.com/common/ssi/cgi-bin/ssialias?htmlfid=32012632UJ5FN&>
- 22 Source: Media Post, 2019 <https://www.mediapost.com/publications/article/331198/iot-consumer-market-projected-to-hit-104-billion.html>
- 23 Source: Retail Dive, 2018 <https://www.retaildive.com/news/retail-iot-could-be-94-billion-market-by-2025/525578/>
- 24 Source: Forbes, 2018 <https://www.forbes.com/sites/mikescott/2018/10/29/5g-technology-set-to-fuel-technological-change-and-transform-global-economy/#45879bf62f51>
- 25 Source: Bain, 2018 <http://www2.bain.com/infographics/digital-transformation/enablers.asp>
- 26 Source: MIT Sloan Management Review, 2017 <https://sloanreview.mit.edu/article/seizing-opportunity-in-data-quality/>
- 27 Source: Accenture, 2018 <https://www.accenture.com/us-en/insight-data-integrity-veracity>
- 28 Source: Harvard Business Review, 2019 <https://hbr.org/2019/02/companies-are-failing-in-their-efforts-to-become-data-driven>
- 29 Source: Pymnts, 2018 <https://www.pymnts.com/news/b2b-payments/2018/surveys-data-driven-technology-business-growth-barriers/>
- 30 Source: Forbes, 2017 <https://www.forbes.com/sites/stanphelps/2017/01/27/minor-the-customer-expectation-gap/>
- 31 Source: Epsilon, 2018 <https://us.epsilon.com/pressroom/new-epsilon-research-indicates-80-of-consumers-are-more-likely-to-make-a-purchase-when-brands-offer-personalized-experiences>
- 32 Source: Datanami, 2018 <https://www.datanami.com/2018/11/27/global-datasphere-to-hit-175-zettabytes-by-2025-idc-says/>
- 33 Source: ZDNet, 2018 <https://www.zdnet.com/article/by-2025-nearly-30-percent-of-data-generated-will-be-real-time-idc-says/>
- 34 Source: Economist Intelligence Unit, 2018 <https://perspectives.eiu.com/technology-innovation/innovating-scale/article/letting-customers-lead>
- 35 Source: EIU Perspectives, 2017 <https://www.eiuperspectives.economist.com/sites/default/files/EIU-ARM-IBM%20IoT%20Business%20Index%202017%20copy.pdf>
- 36 Source: Forbes, 2018 <https://www.forbes.com/sites/forbestechcouncil/2018/01/03/the-future-of-commerce-is-built-on-these-four-pillars/#6bfa57135086>
- 37 Source: Accenture, 2018 <https://www.accenture.com/us-en/insight-predicting-digital-future-retail-cpg>
- 38 Source: Digitalist Magazine (SAP), 2018 <https://www.digitalistmag.com/customer-experience/2018/12/05/with-or-without-you-06193594>
- 39 Source: Bain, 2018 <https://www.bain.com/insights/customer-experience-tools-and-trends-2018>
- 40 Source: Accenture, 2018 <https://www.accenture.com/us-en/blogs/blogs-al-sambar-intelligent-retail-enterprise>
- 41 Source: Forbes, 2018 <https://www.forbes.com/sites/forbestechcouncil/2018/08/03/why-companies-will-need-to-create-an-ai-culture-to-achieve-success/#4138e2e67141>
- 42 Source: Juniper Research, 2018 <https://www.juniperresearch.com/press/press-releases/just-walk-out-shopping-other-smart-checkout>
- 43 Source: IoT Business News, 2017 <https://iotbusinessnews.com/2017/11/15/13695-new-report-envisions-connected-iot-future-2030-barriers-adoption/>
- 44 Source: Cloud Computing, 2018 <https://www.cloudcomputing-news.net/news/2018/oct/02/retail-advertising-and-marketing-are-furthest-road-hybrid-cloud/>
- 45 Source: McKinsey, 2018 <https://www.mckinsey.com/business-functions/digital-mckinsey/our-insights/the-cloud-as-catalyst-for-retail>
- 46 Source: Boston Consulting group, 2019 <https://www.bcg.com/publications/2019/enterprise-applications-cloud-ready-prime-time.aspx?linkid=64245866&redir=true>
- 47 Source: Forbes, 2019 <https://www.forbes.com/sites/oracle/2019/02/07/prediction-80-of-enterprise-it-will-move-to-the-cloud-by-2025/#cc662a676>
- 48 Source: McKinsey, 2018 <https://www.mckinsey.com/business-functions/digital-mckinsey/our-insights/the-cloud-as-catalyst-for-retail>
- 49 Source: McKinsey, 2018 <https://www.mckinsey.com/business-functions/digital-mckinsey/our-insights/the-cloud-as-catalyst-for-retail>
- 50 Source: Dataconomy, 2019 <https://dataconomy.com/2019/02/whats-the-role-of-information-technology-in-the-xaas-era/>
- 51 Source: CIO, 2018 <https://www.cio.com/article/3308418/what-is-xaas-a-way-to-inject-agility-into-your-digital-business.html>
- 52 Source: CIO, 2018 <https://www.cio.com/article/3308418/what-is-xaas-a-way-to-inject-agility-into-your-digital-business.html>
- 53 Source: Thale Security, 2018 <http://go.thalesecurity.com/rs/480-LWA-970/images/2018-Thales-Data-Threat-Report-Retail-Edition-ar.pdf>
- 54 Source: Retail Touchpoints, 2019 <https://www.retailtouchpoints.com/features/executive-viewpoints/a-cloud-security-blanket-for-retail-operators>
- 55 Source: Nutanix, 2019 <https://www.nutanix.com/press-releases/2019/01/14/new-report-shows-retailers-bullish-hybrid-cloud/>
- 56 Source: Nutanix, 2019 <https://www.nutanix.com/press-releases/2019/01/14/new-report-shows-retailers-bullish-hybrid-cloud/>
- 57 Source: Fujitsu, 2018 <https://digitalworkplace.global.fujitsu.com/five-innovations-that-will-revolutionize-the-retail-sector-by-2025/>
- 58 Source: World Economic Forum, 2016 http://www3.weforum.org/docs/1P/2016/CO/WEF_AM17_FutureofRetailInsightReport.pdf
- 59 Source: Boston Consulting Group, 2017 <https://www.bcg.com/publications/2017/retail-marketing-sales-profiting-personalization.aspx?linkid=41155830>
- 60 Source: Venture Beat, 2017 <https://venturebeat.com/2017/09/08/vr-will-be-an-essential-part-of-the-future-of-retail/>
- 61 Source: Knowledge at INSEAD, 2017 <https://knowledge.insead.edu/blog/insead-blog/how-to-thrive-in-the-subscription-economy-6711>
- 62 Source: Inc, 2018 <https://www.inc.com/john-koetsier/61-of-consumers-will-share-personal-data-for-personalized-marketing-communications.html?cid=sf01001>
- 63 Source: Forbes, 2019 https://www.forbes.com/sites/johnkoetsier/2019/02/09/83-of-consumers-believe-personalized-ads-are-morally-wrong-survey-says/amp/?_twitter_impression=true
- 64 Source: strategy + business, 2018 <https://www.strategy-business.com/article/Closing-the-Gap-between-What-Consumers-Want-and-What-They-Get?gkoee2226>
- 65 Source: IDC, via Salesforce, 2018 <https://www.salesforce.com/form/industries/consumer-goods-in-digital-age-report.jsp>
- 66 Source: Network World, citing Gartner, 2018 <https://www.networkworld.com/article/3313884/gartner-digital-business-projects-in-a-quagmire-hack-your-culture.html>
- 67 Source: Deloitte, 2019 <https://www2.deloitte.com/us/en/pages/consulting/articles/future-of-work-for-retail.html>
- 68 Source: Fast Company, 2019 <https://www.fastcompany.com/90302382/its-not-just-google-or-facebook-the-freezer-aisle-is-ad-targeting-you-too>
- 69 Source: Knowledge at Wharton, 2018 <http://knowledge.wharton.upenn.edu/article/where-analytics-is-headed-next/>
- 70 Source: Harvard Business Review, 2016 <https://hbr.org/2016/11/how-predictive-ai-will-change-shopping>
- 71 Source: AdWeek, 2018 <https://www.adweek.com/brand-marketing/how-retail-brands-can-retain-consumers-rather-than-simply-attracting-them/>
- 72 Source: Wired / Hotwire, 2018 <https://cnda.condenast.co.uk/wired/UnderstandingGenerationAlpha.pdf>
- 73 Source: McKinsey, 2018 <https://www.mckinsey.com/business-functions/digital-mckinsey/our-insights/the-cloud-as-catalyst-for-retail>
- 74 Source: Marketing Mag, citing Forrester, 2018 <https://www.marketingmag.com.au/news-c/news-retailers-digital-wallets-forrester/>
- 75 Source: Bain, 2018 <https://www.bain.com/insights/customer-experience-tools-biometric-tools/>
- 76 Source: The Guardian, 2018 <https://www.theguardian.com/money/2018/feb/19/peak-cash-over-uk-rise-of-debit-cards-unbanked-contactless-payments>
- 77 Source: Retail Dive 2017 <https://www.retaildive.com/news/survey-83-of-shoppers-think-they-know-more-than-store-associates/438307/>
- 78 Source: The Age, 2017 <https://www.theage.com.au/breaking-news-business/slow-deliveries-hurting-aust-online-retail-20170516-4u0c4.html>
- 79 Source: Samsung, 2018 <https://insights.samsung.com/2018/07/31/yr-in-retail-the-future-of-shopping-is-virtual-and-augmented/>
- 80 Source: Dell, cited by eWeek, 2018 <http://www.eweek.com/enterprise-apps/dell-survey-suggests-how-automation-ai-will-change-workplaces-by-2030>
- 81 Source: Retail Customer Experience, 2018 <https://www.retailcustomerexperience.com/news/walmart-goes-big-with-virtual-reality-for-employee-training/V>
- 82 Source: Oracle, 2017 <http://www.oracle.com/us/dm/retail2025-final-3744835.pdf>
- 83 Source: Samsung, 2018 <https://insights.samsung.com/2018/07/31/yr-in-retail-the-future-of-shopping-is-virtual-and-augmented/>
- 84 Source: Forbes, 2018 <https://www.forbes.com/sites/danielnewman/2018/02/20/the-iot-impact-on-the-future-of-retail/#79753a7a7b1a>
- 85 Source: Entrepreneur, retrieved 2019 <https://www.entrepreneur.com/article/313970>
- 86 Source: Think Advisor, 2018 <https://www.thinkadvisor.com/2018/09/17/from-robo-advisors-to-brain-chips-the-future-of-ai/?slreturn=20190207093801>
- 87 Source: Forbes, 2018 <https://www.forbes.com/sites/danielnewman/2018/04/25/4-technologies-driving-the-future-of-customer-experience/#34a300193089>
- 88 Source: Phys.org, 2018 <https://phys.org/news/2018-06-star-trek-voice-frontier.html>
- 89 Source: Digital Market Asia, 2017 <http://www.digitalmarket.asia/chinese-consumers-lead-in-usage-of-voice-assistants-report/>
- 90 Source: Cap Gemini, 2018 <https://www.capgemini.com/consulting/2018/01/conversational-commerce-why-consumers-are-embracing-voice-assistants-in-their-lives/>
- 91 Source: The Nation, 2018 <http://www.nationmultimedia.com/detail/business/30339323>
- 92 Source: Deloitte, 2018 <https://www2.deloitte.com/insights/us/en/focus/behavioral-economics/technological-situational-bias-millennial-behavior.html>
- 93 Source: Ericsson, 2018 <https://www.ericsson.com/en/trends-and-insights/consumerlab/consumer-insights/reports/beyond-smartphone-shopping--the-rise-of-smart-assistants>
- 94 Source: PwC, via Business Times, 2018 <https://www.businesstimes.com.sg/consumer/asian-countries-most-sanguine-about-their-economies-pwc-study>
- 95 Source: MIT Sloan Management Review, 2017 <http://sloanreview.mit.edu/article/the-need-for-culture-neutrality/>
- 96 Source: Raconteur, 2017 <https://www.raconteur.net/technology/developing-digital-talent>
- 97 Source: Deloitte/Wall Street Journal, 2017 <http://deloitte.wsj.com/cio/2017/05/23/5-ways-to-nurture-developing-leaders/>
- 98 Source: MIT Sloan Management Review, 2019 <https://sloanreview.mit.edu/article/navigating-a-new-industrial-infrastructure/>
- 99 Source: Digitalist Mag, (SAP) 2015 <http://www.digitalistmag.com/executive-research/building-business-network-future>

About the author

David is a leading strategic futurist who combines the experience gained from a 35 year IT, marketing and business career with strategic visioning to help organisations better prepare for the future. His career has spanned European and US corporations. He is a much sought-after keynote speaker and is the author of many works on embracing change and the drivers of change. Before establishing Global Futures and Foresight, an independent futures research firm, he created and ran the Unisys internal Think Tank, The Global Future Forum. Prior to this he was head of strategic marketing for their \$2bn global financial services business.

The GFF has been engaged by some of the most prestigious firms from around the world including: The European Commission, NATO, BBC and financial services firms including HSBC, Lloyds/TSB, Atom Bank, RBS, Lloyds, More Than, e-sure, Travelers, Allianz, QBE and Lloyds syndicates along with many other prestigious firms including CSC, Unisys, Cisco, Microsoft, Siemens, Deloitte, Ernst & Young, PWC, Linpac, Kraft, Heinz, John Lewis, Roche, Philips, Ogilvy etc. He is also a regular lecturer at business schools across Europe.

Email: david.smith@thegff.com
 LinkedIn: <https://uk.linkedin.com/in/dasmith>
 Twitter: [davidsmithgff](https://twitter.com/davidsmithgff)

About Global Futures and Foresight

Global Futures and Foresight is a research and consulting firm that helps organisations be better prepared to embrace change, innovate and develop new strategies and solutions and helps clients to avoid the risk of being blindsided by external disruptive change.

Website: www.thegff.com
 Telephone: +44 (0)1372 210941 or +44 (0)7932 408901



About Hughes Network Systems

About Hughes Europe

Hughes Europe, a wholly owned subsidiary of Hughes Network Systems, LLC (HUGHES®), is a leading managed services provider to multi-site, distributed enterprises throughout Europe, delivering optimised managed networks that maximise productivity and enhance the customer experience. Providing flexible connectivity solutions and using a multi-vendor approach, Hughes Europe offers Wide Area Network (WAN) connectivity, network resilience, security, optimisation and Software-Defined WAN (SD-WAN) solutions that ensure enterprises the application availability they need to achieve business goals.

For further information, please visit www.hugheseurope.com and follow Hughes Europe at [@hugheseurope](https://twitter.com/hugheseurope) on Twitter.

About Hughes Network Systems

Hughes Network Systems, LLC (HUGHES) is the global leader in broadband satellite technology and services for home and office. Its flagship high-speed satellite Internet service is HughesNet®, the world's largest satellite network with over 1.3 million residential and business customers across the Americas. For large enterprises and governments, the company's HughesON™ managed network services provide complete connectivity solutions employing an optimised mix of satellite and terrestrial technologies. The JUPITER™ System is the world's most widely deployed High-Throughput Satellite (HTS) platform, operating on more than 20 satellites by leading service providers, delivering a wide range of broadband enterprise, mobility and cellular backhaul applications. To date, Hughes has shipped more than 7 million terminals of all types to customers in over 100 countries, representing approximately 50 percent market share, and its technology is powering broadband services to aircraft around the world.

Headquartered outside Washington, D.C., in Germantown, Maryland, USA, Hughes operates sales and support offices worldwide, and is a wholly owned subsidiary of EchoStar Corporation (NASDAQ: SATS), a premier global provider of satellite operations. For additional information about Hughes, please visit www.hughes.com and follow [@HughesConnects](https://twitter.com/HughesConnects) on Twitter.

About EchoStar

EchoStar Corporation (NASDAQ: SATS) is a premier global provider of satellite communication solutions. Headquartered in Englewood, Colo., and conducting business around the globe, EchoStar is a pioneer in secure communications technologies through its Hughes Network Systems and EchoStar Satellite Services business segments. For more information, visit echostar.com. Follow [@EchoStar](https://twitter.com/EchoStar) on Twitter



